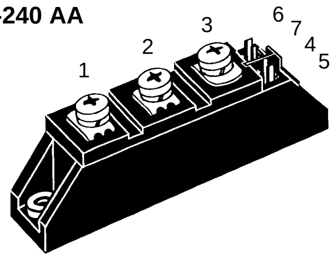
Thyristor Modules

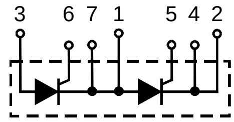
I_{TRMS} = 2x 40 A
I_{TAVM} = 2x 25 A
V_{RRM} = 800-1600 V

V_{RSM} V_{DSM} V	V_{RRM} V_{DRM} V	Type Version 1 B	Version 8 B
900	800	MCC 19-08io1 B	MCC 19-08io8 B
1300	1200	MCC 19-12io1 B	MCC 19-12io8 B
1500	1400	MCC 19-14io1 B	MCC 19-14io8 B
1700	1600	MCC 19-16io1 B	MCC 19-16io8 B

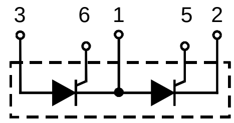
TO-240 AA



Version 1 B



Version 8 B



Symbol	Test Conditions		Maximum Ratings	
I_{TRMS}	$T_{VJ} = T_{VJM}$		40	A
I_{TAVM}	T_C = 58°C; 180° sine		25	A
	T_C = 85°C; 180° sine		18	A
I_{TSM}	T_{VJ} = 45°C;	t = 10 ms (50 Hz), sine	400	A
	V_R = 0	t = 8.3 ms (60 Hz), sine	420	A
	$T_{VJ} = T_{VJM}$	t = 10 ms (50 Hz), sine	350	A
	V_R = 0	t = 8.3 ms (60 Hz), sine	370	A
∫i²dt	T_{VJ} = 45°C	t = 10 ms (50 Hz), sine	800	A²s
	V_R = 0	t = 8.3 ms (60 Hz), sine	730	A²s
	$T_{VJ} = T_{VJM}$	t = 10 ms (50 Hz), sine	600	A²s
	V_R = 0	t = 8.3 ms (60 Hz), sine	570	A²s
$(di/dt)_{cr}$	$T_{VJ} = T_{VJM}$	repetitive, I_T = 45 A	150	A/µs
	f =50 Hz, t_P =200 µs			
	V_D = 2/3 V_{DRM}			
	I_G = 0.45 A	non repetitive, $I_T = I_{TAVM}$	500	A/µs
	di_G/dt = 0.45 A/µs			
$(dv/dt)_{cr}$	$T_{VJ} = T_{VJM}$;	V_{DR} = 2/3 V_{DRM}	1000	V/µs
	R_{GK} = ∞; method 1 (linear voltage rise)			
P_{GM}	$T_{VJ} = T_{VJM}$	t_P = 30 µs	10	W
	$I_T = I_{TAVM}$	t_P = 300 µs	5	W
P_{GAV}			0.5	W
V_{RGM}			10	V
T_{VJ}			-40...+125	°C
T_{VJM}			125	°C
T_{stg}			-40...+125	°C
V_{ISOL}	50/60 Hz, RMS	t = 1 min	3000	V~
	I_{ISOL} ≤ 1 mA	t = 1 s	3600	V~
M_d	Mounting torque (M5)		2.5-4.0/22-35	Nm/lb.in.
	Terminal connection torque (M5)		2.5-4.0/22-35	Nm/lb.in.
Weight	Typical including screws		90	g

Data according to IEC 60747 and refer to a single thyristor unless otherwise stated.
IXYS reserves the right to change limits, test conditions and dimensions

Features

- International standard package, JEDEC TO-240 AA
- Direct copper bonded Al_2O_3 -ceramic base plate
- Planar passivated chips
- Isolation voltage 3600 V~
- UL registered, E 72873
- Gate-cathode twin pins for version 1B

Applications

- DC motor control
- Softstart AC motor controller
- Light, heat and temperature control

Advantages

- Space and weight savings
- Simple mounting with two screws
- Improved temperature and power cycling
- Reduced protection circuits

Symbol	Test Conditions		Characteristic Values	
I_{RRM}, I_{DRM}	$T_{VJ} = T_{VJM}$; $V_R = V_{RRM}$; $V_D = V_{DRM}$		3	mA
V_T	I_T = 80 A; T_{VJ} = 25°C		2.05	V
V_{T0} r_T	For power-loss calculations only (T_{VJ} = 125°C)		0.85 18	V mΩ
V_{GT}	V_D = 6 V;	T_{VJ} = 25°C T_{VJ} = -40°C	1.5 1.6	V V
I_{GT}	V_D = 6 V;	T_{VJ} = 25°C T_{VJ} = -40°C	100 200	mA mA
V_{GD} I_{GD}	$T_{VJ} = T_{VJM}$;	V_D = 2/3 V_{DRM}	0.2 10	V mA
I_L	T_{VJ} = 25°C; t_P = 10 µs; V_D = 6 V I_G = 0.45 A; di_G/dt = 0.45 A/µs		450	mA
I_H	T_{VJ} = 25°C; V_D = 6 V; $R_{GK} = \infty$		200	mA
t_{gd}	T_{VJ} = 25°C; V_D = 1/2 V_{DRM} I_G = 0.45 A; di_G/dt = 0.45 A/µs		2	µs
t_q	$T_{VJ} = T_{VJM}$; I_T = 20 A, t_P = 200 µs; -di/dt = 10 A/µs V_R = 100 V; dv/dt = 20 V/µs; V_D = 2/3 V_{DRM}	typ.	150	µs
Q_S I_{RM}	$T_{VJ} = T_{VJM}$; I_T = 25 A, -di/dt = 0.64 A/µs		50 6	µC A
R_{thJC}	per thyristor; DC current per module	other values see Fig. 8/9	1.3 0.65	K/W K/W
R_{thJK}	per thyristor; DC current per module		1.5 0.75	K/W K/W
d_S d_A a	Creepage distance on surface Strike distance through air Maximum allowable acceleration		12.7 9.6 50	mm mm m/s²

Optional accessories for module-type MCC 19 version 1 B
Keyed gate/cathode twin plugs with wire length = 350 mm, gate = yellow, cathode = red
Type **ZY 200L** (L = Left for pin pair 4/5) } UL 758, style 1385,
Type **ZY 200R** (R = right for pin pair 6/7) } CSA class 5851, guide 460-1-1

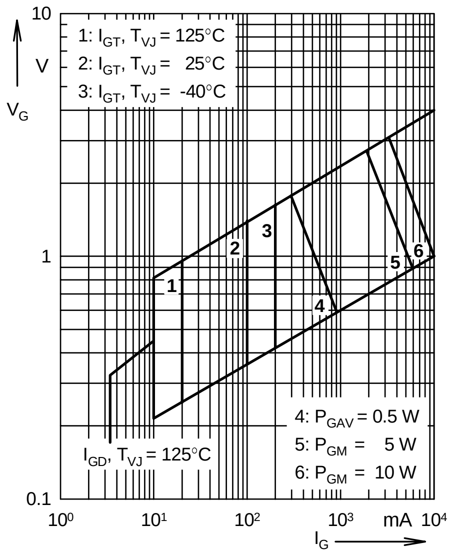


Fig. 1 Gate trigger characteristics

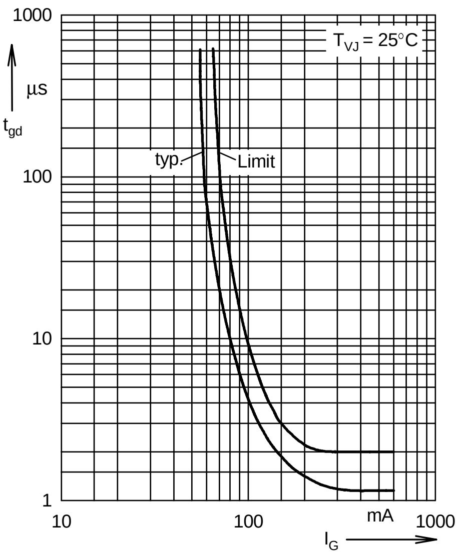
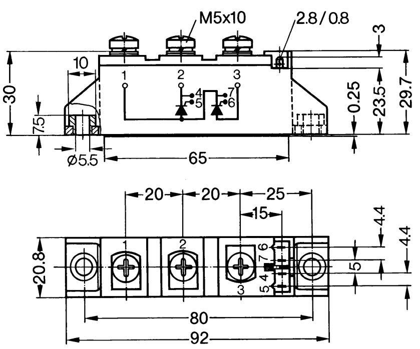


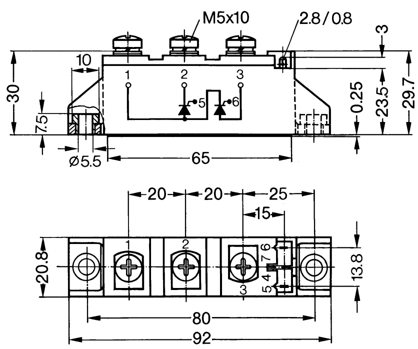
Fig. 2 Gate trigger delay time

Dimensions in mm (1 mm = 0.0394")

Version 1 B



Version 8 B



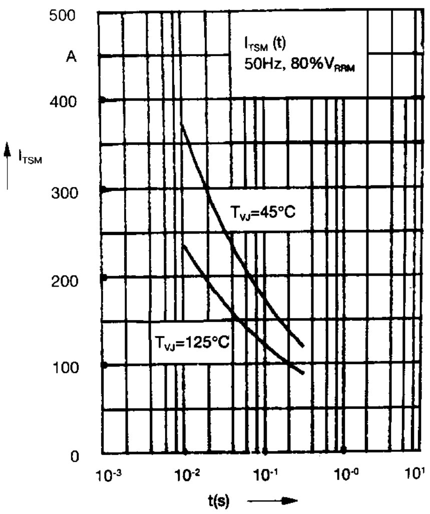


Fig. 3 Surge overload current I_{TSM}: Crest value, t: duration

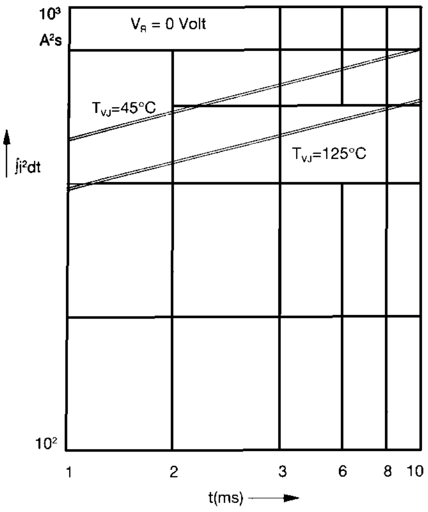


Fig. 4 ∫i²dt versus time (1-10 ms)

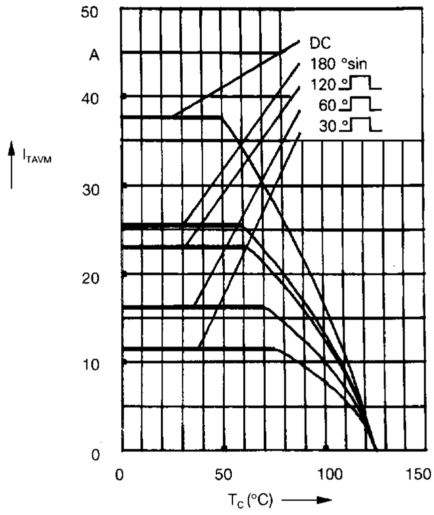


Fig. 4a Maximum forward current at case temperature

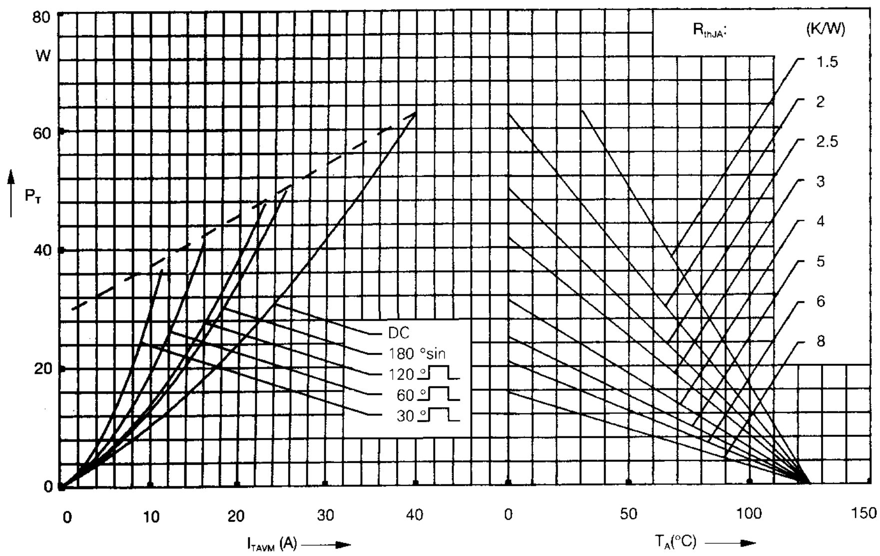


Fig. 5 Power dissipation versus on-state current and ambient temperature (per thyristor)

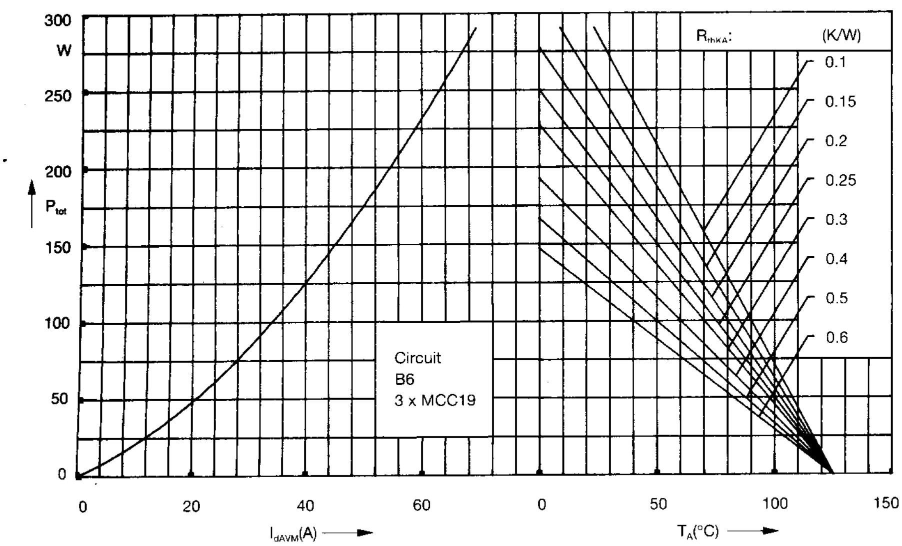


Fig. 6 Three phase rectifier bridge: Power dissipation versus direct output current and ambient temperature

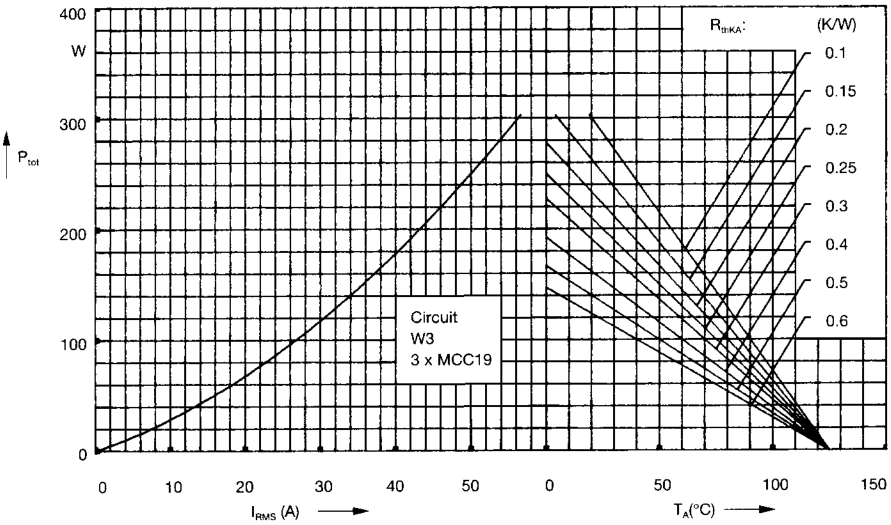


Fig. 7 Three phase AC-controller: Power dissipation versus RMS output current and ambient temperature

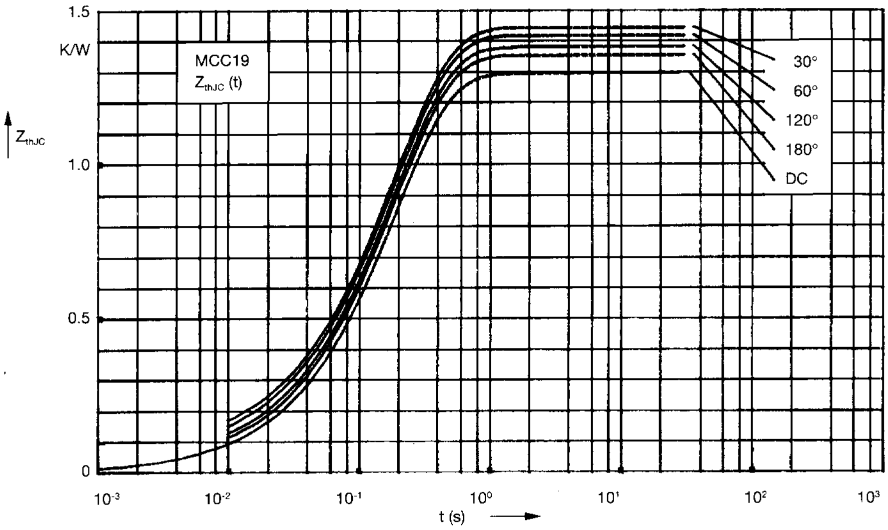


Fig. 8 Transient thermal impedance junction to case (per thyristor)

R_{thJC} for various conduction angles d:

d	R_{thJC} (K/W)
DC	1.3
180°	1.35
120°	1.39
60°	1.42
30°	1.45

Constants for Z_{thJC} calculation:

i	R_{thi} (K/W)	t_i (s)
1	0.018	0.0033
2	0.041	0.0216
3	1.241	0.191

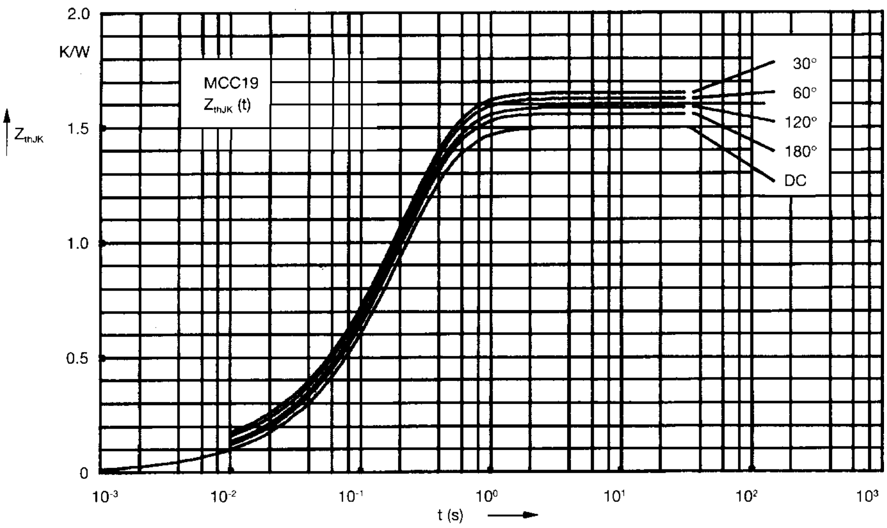


Fig. 9 Transient thermal impedance junction to heatsink (per thyristor)

R_{thJK} for various conduction angles d:

d	R_{thJK} (K/W)
DC	1.5
180°	1.55
120°	1.59
60°	1.62
30°	1.65

Constants for Z_{thJK} calculation:

i	R_{thi} (K/W)	t_i (s)
1	0.018	0.0033
2	0.041	0.0216
3	1.241	0.191
4	0.2	0.46